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| 10/763,734 | 01/23/2004 | Robert J. Burnett | P1938US00 | 7329 |
| 24333 7590 06/04/2007 GATEWAY, INC. ATTN: Patent Attorney 610 GATEWAY DRIVE MAIL DROP Y-04 N. SIOUX CITY, SD 57049 | | | EXAMINER PATEL, HETUL B | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/763,734

Applicant(s)

BURNETT ET AL.

Examiner

Hetul Patel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 March 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This office action is in response to the amendment and arguments filed on March 20, 2007. Claims 1, 4, 8 and 21 are amended; claim 22 is newly added; and none of the claims are cancelled. Therefore, claims 1-22 are currently pending in the application.
2. Applicant's arguments filed on March 30, 2007 have been fully considered and they are persuasive. Therefore, the rejection(s) made under Oh prior art in the last office action has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Ebstyne et al. (USPN: 2002/0194340).
3. The indicated allowability of dependent claim 21 in the previous office action is withdrawn; and as a result of that, this office action is made Non-final.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-7, 11, 13-16, 20 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Ebstyne et al. (USPN: 2002/0194340) hereinafter, Ebstyne.

As per claim 1, Ebstye teaches a method of creating a virtual disk storage (i.e. the aggregated contiguous virtual data storage space) construct using disk storage consolidated from at least two grid computers (i.e. from PC hard drives from distributed network system) of a computing grid utilizing a connecting network (i.e. via network as shown in Fig. 1), comprising: locating an unused portion of disk storage space on a disk drive of each of the at least two grid computers (i.e. unused/additional hard drive space from the PCs on the distributed network system) connected by the connecting network of the computing grid; and presenting, as a single combined virtual storage drive on at least one computer (i.e. for any PC connected on the enterprise network), a portion of the unused portion (i.e. the unused/additional hard drive space from the PCs on the distributed network system) of the disk storage space from the disk drive of each of the at least two grid computers (i.e. the aggregated contiguous virtual data storage space made of plurality of PC hard drives on network) (e.g. see paragraphs [0025]-[0026] and [0030]-[0031] and Fig. 1).

As per claim 2, Ebstye teaches the claimed invention as described above and furthermore, Ebstye teaches that the method including allocating a portion of the total disk storage space on each of the at least two grid computers (i.e. the unused/additional hard drive space from the PCs on the distributed network system) to be made available as part of the virtual storage drive (i.e. the aggregated contiguous virtual data storage space) (e.g. see paragraphs [0025]-[0026]).

As per claim 3, Ebstye teaches the claimed invention as described above and furthermore, Ebstye teaches about reserving a portion of predetermined size of the

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total disk storage space (i.e. 15% of the PD's disk space) on each of the at least two grid computers (i.e. PCs on the network), the reserved portion of the disk drives being reserved for local use on the respective grid computer of the at least two grid computers (e.g. see paragraph [0031]).

As per claim 4, Ebstyn teaches the claimed invention as described above and furthermore, Ebstyn teaches about determining the total disk storage space on each of the at least two grid computers and allocating the total disk storage space (i.e. more than 1.5 petabytes) between a portion made available for use as part of the virtual storage drive (i.e. about 330 terabytes of additional/unused space) and a portion reserved for local use on the grid computers (i.e. 15% of the disk space) (e.g. see paragraph [0031]); wherein the portion available for use as part of the virtual storage space is of a fixed size (i.e. 85% of the disk space) and the portion reserved for local use on the grid computer is of a fixed size (i.e. 15% of the disk space) (e.g. see paragraph [0031]).

As per claim 5, Ebstyn teaches the claimed invention as described above and furthermore, Ebstyn teaches about maintaining a table of grid computers contributing storage space to the virtual storage drive and corresponding amounts of storage space made available by each contributing grid computers (e.g. see paragraph [0067]).

As per claims 6 and 7, Ebstyn teaches the claimed invention as described above and furthermore, Ebstyn teaches about monitoring at least one of the grid computers for activity indicating that additional disk storage space has been added to the at least one grid computer; and allocating disk storage space on the at least one

grid computer after detecting activity indicating that additional storage space has been added to the at least one grid computer (e.g. see paragraph [0047], lines 10-11).

As per claims 13-16, see arguments with respect to the rejection of claims 1-3 and 6, respectively. Claims 13-16 and 18-19 are also rejected based on the same rationale as the rejection of claims 1-3 and 6, respectively.

As per claim 11, Ebstyne teaches the claimed invention as described above and furthermore, Ebstyne teaches that the method additionally including loading an agent application (i.e. the client tier) on each of the grid computers (i.e. in each PC) for managing the portion of the unused portion of the total disk storage space on the grid computer made available to the virtual storage drive (e.g. see paragraphs [0047]).

As per claim 20, Ebstyne teaches the claimed invention as described above and furthermore, Ebstyne teaches that the step of reserving a portion of the total disk storage space includes restricting the reserved portion from inclusion in the single virtual storage presented (i.e. 15% of the disk space is reserved from inclusion in the single virtual storage) (e.g. see paragraph [0031]).

As per claim 22, Ebstyne teaches the claimed invention as described above and furthermore, Ebstyne teaches that the step of presenting includes presenting the single combined virtual storage drive to a user of the at least one grid computer (e.g. see paragraph [0058]).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 8-9 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ebstye in view of Ebata et al. (USPN: 2004/0044698) hereinafter, Ebata.

As per claims 8 and 9, Ebstye teaches the claimed invention as described above. However, Ebstye failed to teach the further limitations of (i) monitoring at least one of the grid computers for activity indicating that a predetermined minimum amount of free disk storage space of the total disk storage space on the grid computer has not been maintained; wherein the predetermined minimum amount of free disk storage space is set using an agent application on the at least one grid computer; and (ii) allocating disk storage space on the at least one grid computer for use by local applications after detecting activity indicating that the minimum amount of free disk storage space has not been maintained to restore at least the minimum amount of free disk storage space. Ebata, on the other hand, teaches a method for moving files between storages across the network to rebalance the free disk space across the network.

Ebata, on the other hand, teaches the method includes the step of monitoring at least one of the grid computers (i.e. at least one of the storage across the network) for activity indicating that a predetermined minimum amount (i.e. the threshold value) of

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free disk storage space of the total disk storage space on the grid computer has not been maintained (i.e. there is imbalance in available and minimum free disk space), wherein the predetermined minimum amount of free disk storage space is set using an agent application (i.e. an instruction from an administrator) on the at least one grid computer (i.e. the threshold value is set in the configuration information module (i.e. 180 in Fig. 1) of at least one grid computer (i.e. 8 in Fig. 1) (e.g. see paragraph [0045]); and (ii) allocating disk storage space on the at least one grid computer for use by local applications after detecting activity indicating that the minimum amount of free disk storage space has not been maintained to restore at least the minimum amount of free disk storage space (e.g. see the abstract). Accordingly, it would have been obvious to one ordinary skilled in the art at the time of the current invention was made to implement the steps taught by Ebata in the method taught by Ebstyne. In doing so, (i) a steady imbalance of the free disk spaces among the network storages is prevented so that clients can always use the system and even if client writes large files and a maximum quantity of data can be written to disks managed by the virtualized network storage system; and (ii) during file migration between network storages, access requests from clients are not stopped while a file is being moved between network storages (e.g. see paragraphs [0015]-[0016]).

As per claim 17, see arguments with respect to the rejection of claim 8. Claim 17 is also rejected based on the same rationale as the rejection of claim 8.

6. Claims 10 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ebstyne in view of Wells et al. (USPN: 5,416,782) hereinafter, Wells.

As per claim 10, Ebstyne teaches the claimed invention as described above, but failed to teach that the method additionally including providing a safe area on disk storage space of the virtual storage drive, the safe area being kept free of data. Wells, however, teaches about keeping a portion of the memory space free of data to allow the cleanup operation (e.g. see Col. 5, lines 1-6). Accordingly, it would have been obvious to one ordinary skilled in the art at the time of the current invention was made to implement the step taught by Wells in Ebstyne's method. In doing so, data can be temporarily stored at this safe area when (i) data needs to be transferred within the memory space; and (ii) the cleanup operation is required to run.

As per claim 18, see arguments with respect to the rejection of claim 10. Claim 18 is also rejected based on the same rationale as the rejection of claim 10.

7. Claims 12 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ebstyne in view of Watkins et al. (USPN: 2002/0015336) hereinafter, Watkins.

As per claim 12, Ebstyne teaches the claimed invention as described above, but does not teach the step of backing up data by copying data from a reserved portion of the disk storage space to the virtual storage drive. Watkins, however, discloses a step of copying data from a reserved portion (i.e. the second data storage areas, 509-511 in Fig. 5) of the disk storage space (i.e. 200-202 in Fig. 2) of at least one of the grid computers (i.e. 100-102 in Fig. 1) to an available portion of at least two other grid

computers of the computing grid that have been made available to the virtual storage drive (i.e. the first data storage areas, 203-205 in Figs. 2 and 5) to thereby backup the copied data from the reserved portion of the at least one grid computer (e.g. see the abstract and Figs. 1-2 and 5). Accordingly, it would have been obvious to one ordinary skilled in the art at the time of the current invention was made to implement the teachings of Watkins in the method taught by Ebstyne so in the event of failure of any one of the data storage devices, data can be recovered from the second data storage areas of the other data storage devices.

As per claim 19, see arguments with respect to the rejection of claim 12. Claim 19 is also rejected based on the same rationale as the rejection of claim 12.

8. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oh (USPN: 2005/0050292).in view of Ebata, further in view of Wells and Watkins.

As per claim.21, Ebstyne teaches a method of creating a virtual disk storage (i.e. the aggregated contiguous virtual data storage space) construct using disk storage consolidated from at least two grid computers (i.e. from PC hard drives from distributed network system) of a computing grid utilizing a connecting network (i.e. via network as shown in Fig. 1), comprising:

- locating an unused portion of a total disk storage space on at least one disk drive of each grid computer of the at least two grid computers (i.e. unused/additional hard drive space from the PCs on the distributed network system) connected by the connecting network of the computing grid; and

presenting, on at least one computer (i.e. for any PC connected on the enterprise network), a portion of the unused portion (i.e. the unused/additional hard drive space from the PCs on the distributed network system) of the total disk storage space of each of the at least two grid computers as a single combined virtual storage drive (i.e. the aggregated contiguous virtual data storage space made of plurality of PC hard drives on network) (e.g. see paragraphs [0025]-[0026] and [0030]-[0031] and Fig. 1);

- determining the total disk storage space on each of the at least two grid computers (e.g. see paragraphs [0030]-[0031]) and allocating the total disk storage space between a portion made available for use as part of the virtual storage drive and a portion reserved for local use on the grid computer; allocating a portion of the total disk storage space on each of the at least two grid computers (i.e. the unused/additional hard drive space from the PCs on the distributed network system) to be made available as part of the virtual storage drive (i.e. the aggregated contiguous virtual data storage space) (e.g. see paragraphs [0025]-[0026]);
- reserving a portion of predetermined size of the total disk storage space (i.e. 15% of the PD's disk space) on each of the at least two grid computers (i.e. PCs on the network); the reserved portion of the disk drives being reserved for local use on the respective grid computer of the at least two grid computers (e.g. see paragraph [0031]);

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- maintaining a table of grid computers contributing storage space to the virtual storage drive and corresponding amounts of storage space made available by each contributing grid computers (e.g. see paragraph [0067]);
- monitoring at least one of the grid computers for activity indicating that additional disk storage space has been added to the at least one grid computer; and reallocating disk storage space on the at least one grid computer after detecting activity indicating that additional storage space has been added to the at least one grid computer (e.g. see paragraph [0047], lines 10-11); and
- loading an agent application (i.e. the client tier) on each of the grid computers (i.e. in each PC) for managing the portion of the unused portion of the total disk storage space on the grid computer made available to the virtual storage drive (e.g. see paragraphs [0047]).

However, Ebstyne failed to teach the further limitations of (i) monitoring at least one of the grid computers for activity indicating that a predetermined minimum amount of free disk storage space of the total disk storage space on the grid computer has not been maintained; wherein the predetermined minimum amount of free disk storage space is set using an agent application on the at least one grid computer; and (ii) allocating disk storage space on the at least one grid computer for use by local applications after detecting activity indicating that the minimum amount of free disk storage space has not been maintained to restore at least the minimum amount of free disk storage space. Ebata, on the other hand, teaches a method for moving files

between storages across the network to rebalance the free disk space across the network.

Ebata, on the other hand, teaches the method includes the step of monitoring at least one of the grid computers (i.e. at least one of the storage across the network) for activity indicating that a predetermined minimum amount (i.e. the threshold value) of free disk storage space of the total disk storage space on the grid computer has not been maintained (i.e. there is imbalance in available and minimum free disk space), wherein the predetermined minimum amount of free disk storage space is set using an agent application (i.e. an instruction from an administrator) on the at least one grid computer (i.e. the threshold value is set in the configuration information module (i.e. 180 in Fig. 1) of at least one grid computer (i.e. 8 in Fig. 1) (e.g. see paragraph [0045]); and (ii) allocating disk storage space on the at least one grid computer for use by local applications after detecting activity indicating that the minimum amount of free disk storage space has not been maintained to restore at least the minimum amount of free disk storage space (e.g. see the abstract). Accordingly, it would have been obvious to one ordinary skilled in the art at the time of the current invention was made to implement the steps taught by Ebata in the method taught by Ebstyne. In doing so, (i) a steady imbalance of the free disk spaces among the network storages is prevented so that clients can always use the system and even if client writes large files and a maximum quantity of data can be written to disks managed by the virtualized network storage system; and (ii) during file migration between network storages, access

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requests from clients are not stopped while a file is being moved between network storages (e.g. see paragraphs [0015]-[0016]).

The combination of Ebstyne and Ebata teaches the claimed invention as described above, but both failed to teach that the method additionally including providing a safe area on disk storage space of the virtual storage drive, the safe area being kept free of data. Wells, however, teaches about keeping a portion of the memory space free of data to allow the cleanup operation (e.g. see Col. 5, lines 1-6). Accordingly, it would have been obvious to one ordinary skilled in the art at the time of the current invention was made to implement the step taught by Wells in the method taught by the combination of Ebstyne and Ebata. In doing so, data can be temporarily stored at this safe area when (i) data needs to be transferred within the memory space; and (ii) the cleanup operation is required to run.

The combination of Ebstyne, Ebata and Wells teaches the claimed invention as described above, but none of them teach the step of backing up data by copying data from a reserved portion of the disk storage space to the virtual storage drive. Watkins, however, discloses a step of copying data from a reserved portion (i.e. the second data storage areas, 509-511 in Fig. 5) of the disk storage space (i.e. 200-202 in Fig. 2) of at least one of the grid computers (i.e. 100-102 in Fig. 1) to an available portion of at least two other grid computers of the computing grid that have been made available to the virtual storage drive (i.e. the first data storage areas, 203-205 in Figs. 2 and 5) to thereby backup the copied data from the reserved portion of the at least one grid computer (e.g. see the abstract and Figs. 1-2 and 5). Accordingly, it would have been

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obvious to one ordinary skilled in the art at the time of the current invention was made to implement the teachings of Watkins in the method taught by the combination of Ebstyne, Ebata and Wells so in the event of failure of any one of the data storage devices, data can be recovered from the second data storage areas of the other data storage devices.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hetul Patel whose telephone number is 571-272-4184. The examiner can normally be reached on 8:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Kim can be reached on 571-272-4182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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